August, 1912. Entomological Series. Vol. IV, No. 2

Memoirs of the Department of Agriculture in India

TETRIGINÆ (ACRIDIINÆ) IN THE AGRICULTURAL RESEARCH INSTITUTE, PUSA, BIHAR, WITH DESCRIPTIONS OF NEW SPECIES

BY

DR. J. L. HANCOCK, F.E.S

AGRICULTURAL RESEARCH INSTITUTE, PUSA

PUBLISHED FOR
THE IMPERIAL DEPARTMENT OF AGRICULTURE IN INDIA

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THACKER, SPINK & CO., CALCUTTA
W. THACKER & CO., 2, CREED LANE, LONDON

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DR. J. L. HANCOCK.

The members of this subfamily of small acridians are so variable in structure and colouration, that difficulty is experienced in drawing specific distinctions between some of the closely allied forms. A notable instance of this variability is shown in the genus *Euparatettix* Hanc., which in India and Ceylon is represented by a number of species showing considerable fluctuating variations among individuals, as well as apparent hybrids. These various forms, of course, have not been given separate consideration, as only experimental pedigreed breeding can determine the limitations of these forms. The best that could be done was a systematic arrangement of species, and by a careful study of this genus the members can be divided into two groups, as shown in my key to the species, by the characters of the frontal costa and position of the superior paired ocelli.

Walker(1) has described under *Tettix* a number of species of Tettigids from India and Ceylon, some of which I find next to impossible to consign to their systematic position. Kirby has helped matters recently by attempting to place Walker's species in his "Synonymic Catalogue of Orthoptera," but until these species are again clearly described from the types in the British Museum, many of them will remain obscure through one's inability to recognize them from the original descriptions.

(1) Catalog. Dermap. Saltatoria, British Museum, Part V, 1871.

The material forming the basis of this paper was mainly from the Agricultural Research Institute, Pusa, Bihar. The insects were submitted to me for determination by the Officiating Imperial Entomologist, Mr. T. Bainbrigge Fletcher, to whom I tender my acknowledgment. The species are nearly all from India, but some additional species from other regions, represented in my collection, are treated in connection with the foregoing material.

Genus Scelimena.

Serville, Hist. Nat. des Ins. Orthopt., p. 762, 1839 ; Bolivar, Ann. Soc. Ent. Belg., XXXI, p. 215, 1887 ; Hancock, Spol. Zeylan. II, p. 107, 1904 ; Gen. Insect., Fasc. 48, pp. 21—22, 1906.

S. harpago, Serv.

Tetrix (*Scelimena*) *harpago*, Serv. l. c., p. 763, 1839.

This species is represented in the Pusa collection from Matheran, 2,500 ft., April 1908 (*D. Nowrojee*).

Allied to *S. logani* Hanc., but conspicuously differs by the presence of a broad substraight spine on each side arming the lateral lobes of the pronotum. The spines in *logani* Hanc., are hooked and accompanied by a secondary tubercle placed before them on each side.

Genus Criotettix.

Bolivar, Ann. Soc. Ent. Belg. XXXI, p. 222, 1887 ; Hancock, Spol. Zeylan. II, p. 128, 1904 ; Gen. Insect. Fasc. 48, p. 27, 1906.

C. extremus sp. nov.

Body large, granose, dark, obscurely mottled with fuscous. Vertex slightly narrower than one of the eyes, little widened backward, the small frontal carinulæ little obliquely elevated laterally and abruptly terminated. Eyes globose ; frontal costa narrow, in profile little compressed, arcuate between the antennæ, interrupted just above the paired ocelli, and between the eyes scarcely protuberant yet not distinctly produced ; paired ocelli placed between the middle of the eyes ; antennæ inserted scarcely lower

than the angles of the eyes. Pronotum deplanate, dorsum granose, uneven between the shoulders, and behind the shoulders distinctly bifossulate, the upper aspect of the base of process presenting a series of uneven depressions and small elevated nodes; median carina discontinuous, irregularly sinuate, obsolete forward near the front border, nodulose between the thoracic sulci, more conspicuous over base of process and obliterated backward toward the pronotal apex; posterior process lengthily acute produced beyond the hind femoral knees; lateral lobes outwardly deflexed and laterally produced in an acute straight spine directed transversely. Elytra elongate, strongly punctate, apices rounded; wings fully explicate, almost reaching the apex of pronotal process. Anterior femora slender, margins entire; middle femora somewhat bilobate below; posterior femoral margins entire or minutely serrulate; posterior tibiæ moderately dilated toward the apices but not like *Scelimena*, the carinæ armed with spines; the first article of the posterior tarsi narrow, equal in length to the third article, the pulvilli rather stout and graded in size from first to the third, the third longest and flat below.

Male type, entire length of body 18·5 mm.; pronotum 17·8 mm.; posterior femora 7 mm.

Habitat: MADRAS, Shevaroys, 4,000 ft. (*C. W. Mason*) Aug. 24, 1907, Pusa collection.

This large species recalls to mind *Scelimena gavialis* Serv., but a closer study of its characters shows its true position in *Criotettix* Bol. and it resembles *C. flavopictus* Bol.

C. montanus sp. nov.

A moderately large species, resembling the preceding; body granose, coloured cinereous. Vertex smoother, slightly narrower than one of the eyes, little ampliate backward, middle carinate; eyes globose; frontal costa lightly arcuate between the antennæ, moderately sulcate and extended above the paired ocelli to the vertex. Antennæ inserted between the lower angles of the eyes. Pronotum deplanate on the dorsum, rather smooth, on each side between

the shoulders provided with very indistinct abbreviated carinula, uneven on the disc, lightly bifossulate behind; prozonal carinæ forward distinct and barely convergent backward; posterior process acuminate produced beyond the hind femoral knees, toward the apex smooth; median carina irregularly undulate; lateral lobes scarcely deflexed, little triangulate produced, but not distinctly spined. Elytra subovate acuminate, the apices rounded, wings reaching to the end of pronotal process. Anterior and middle femora entire; posterior femoral margins above granose or minutely serrulate, the outer face granose; posterior tibiæ somewhat sinuate-curvate, the carinæ armed with spines; the first and third articles of posterior tarsi equal in length, the first to the third pulvilli graded in length, the third longest and more decidedly flattened below.

Male, entire length of body 16·5 mm.; pronot. 15 mm.; posterior femora 7 mm.

Habitat: PUNJAB, Simla, 7,000 ft., Oct. 1907 (*H. M. Lefroy*), Pusa collection.

This species is distinguished from *extremus* by the wider sulcation of the frontal costa, and its extension above or behind the paired ocelli, the smoother dorsum of pronotum, and the triangulate but not spined lateral lobes, which are distinctly spined in *extremus*.

C. grandis sp. nov.

Body slightly larger than *extremus*, rather smooth, resembling that species, while somewhat suggestive of *Eugavialidium* Hanc.; coloured cinereous-rufescent, eyes pale, legs marked with fuscous. Vertex smooth, subequal to one of the eyes, slightly ampliate backward, middle carina very small anteriorly and scarcely projecting; the frontal carinulæ hardly elevated; frontal costa little arcuate between the antennæ, divided above the paired ocelli, moderately divergent forward; antennæ inserted between the lower angles of the eyes. Pronotum slightly angularly excavate at the front margin; dorsum deplanate and somewhat smooth granose,

the disc and base of process longitudinally bifossulate, not bearing nodulate elevations as in *extremus ;* posterior process smooth and rounded, lengthily acuminate produced beyond the hind femoral knees ; anterior prozonal carinæ convergent backward ; very thin abbreviated carinulæ appear between the shoulders ; median carina low, strongly depressed, little elevated nodulate between the thoracic sulci forward, straight on process and nearly obliterated toward the apex ; lateral lobes decidedly deflexed, the posterior angles bearing distinct triangular sharp spines directed transversely ; elytra ovate, narrowed toward the base ; wings extended to apex of pronotal process. Anterior and middle femora slender, margins entire, posterior femoral margins minutely serrulate ; hind tibiæ sinuate-curvate and armed with spines.

Male and female, entire length of body 17·5—20 mm. ; pronotum 17—19 mm. ; post. femora 6·4—8 mm.

Habitat : Assam, Cherapunji, Khasi Hills. In my collection.

This species resembles *C. flavopictus* Bol., but differs in being larger and more depressed between the shoulders. In my former paper in Trans. Ent. Soc., London, p. 220, 1907, this species was taken for *flavopictus*, but more material in hand for comparison is convincing evidence that they are distinct.

C. tricarinatus, Bol.

Bolivar, Ann. Soc. Ent. Belg. XXXI, p. 224, 1887 ; Hancock, Spolia Zeylanica II, p. 128, 1904, Figs. 15—15b.

Habitat : Madras, Shevaroys, 4,000 ft. ; Aug. 24, 1907 (*C. W. Mason*), "on grass," Pusa collection.

Three examples of this species from this locality are indistinguishable from specimens in my collection from Ceylon.

C. æqualis sp. nov.

Body very smooth, granose punctate ; coloured pale yellowish brown ; eyes globose and prominent. Vertex smooth, narrower than one of the eyes, very little ampliate backward, middle feebly carinate, and depressed on each side, frontal cari-

nulæ arcuate reflexed laterally; frontal costa narrowly divided above the paired ocelli, divergent and more crassate below, in profile arcuate between the antennæ; paired ocelli placed between the middle of the eyes; antennæ inserted between the lower fourth of the eyes. Pronotum subcylindrical forward, the anterior prozonal carinæ nearly obliterated, dorsum deplanate, smooth granose-punctate, lengthily longitudinally bifossulate on disc and base of process, between the shoulders bearing two abbreviated carinæ not at all distinct, posterior process lengthily acute produced; median carina indistinct forward near the anterior border, little elevated between the thoracic sulci and very low obliterated backward toward the apex of process; lateral lobes moderately deflexed, slightly triangulate produced but not strictly spined. Anterior femora slender, margins entire; anterior tarsi annulate with fuscous.

Sex not apparent owing to mutilation; entire length of body to apex of pronotum 18·5 mm.; pronotum 17 mm.

Habitat: Bengal, Phoobsering, Lebong, 5,000 ft. (*Partridge*) Nov. 1910, Pusa collection.

This species recalls *Bolotettix* Hanc. in the smooth dorsum and obliterated prozonal carinæ, but the insertion of the antennæ between the eyes and other characters mentioned above places it in *Criotettix*, Bol.

Genus Loxilobus.

Hancock, Spolia Zeylanica II, p. 134, 1904.

L. assamus Hanc.

Hancock, Trans. Ent. Soc., London, p. 223, 1907.

Habitat: Bengal, Lebong, 5,000 ft., Sept. 1908 (*H. M. Lefroy*), Pusa collection.

In the original description of this species the measurements were inadvertently omitted and are given herewith:—

Male and female, entire length of body 8—9 mm.; pronotum 8 mm.; post. femora 6 mm.

L. hancocki Kirby.

Loxilobus rugosus Hancock, Spol. Zeylanica II, p. 135, 1904; Kirby, Syn. Cat. Orthopt. III, p. 18, 1910, *rugosus* Hanc. preoccupied.

Habitat: Bombay, Bassein Fort, Oct. 1909 (*A. Mujtaba*), Pusa collection.

The type from which I described this species is from Ceylon and the examples from Bombay do not differ from the type.

L. acutus Hanc.

Hancock, Spolia Zeylanica II, p. 134, 1904, Figs. 3, and 16*a*, 16*b*.

Male—Body slender, rugose granulate; colour grayish. Vertex slightly wider than one of the eyes, ampliate backward, fossulate on each side between the middle of the eyes, median carina in front joined with the frontal costa formed in a rounded produced profile, viewed in front barely sulcate above the paired ocelli and narrowly divergent forward. Pronotum rugose, bearing small tubercles and granulose lines, dorsum convex between but slightly depressed behind the shoulders; humeral carinæ distinct; prozonal carinæ forward short and convergent backward; median carina interrupted compressed-sinuate; posterior process lengthily acute produced; lateral lobes deflexed, margins oblique, posterior angles armed with small spines with subcarinate base; wings fully explicate, extended beyond the pronotal apex; elytra elongate, apices rounded. Posterior femoral margins entire, external surface rugose; hind tibiæ lightly subsinuate-curvate, armed with spines; first articles of posterior tarsi longer than the third.

Entire length of body 13 mm.; pronotum 12 mm.; post. femora 5 mm.

Habitat: Bihar, Pusa, July 9, 1910 (*T. Bainbrigge Fletcher*), Pusa coll.

The spines of the lateral lobes in this male are slightly sharper than in the type female from Ceylon, but in other respects it is similar.

Genus THORADONTA.

Hancock, Trans. Ent. Soc., London, p. 407, 1907.

T. spiculoba sp. nov.

Resembling *spinata* Hanc. Body rugose; coloured cinereous, brownish, or fuscous. Vertex about twice the breadth of one of the eyes, subquadrate, in profile scarcely or not produced beyond the eyes; frontal costa narrowly sulcate between the paired ocelli, rather widely divergent forward, in profile sinuate between the eyes and protuberant between the antennæ. Pronotum above rugose, gibbulose forward between the thoracic sulci, ampliate between the shoulders; prozonal carinæ forward nearly parallel; humeral angles distinct and carinate; lateral carinæ behind the shoulders elevated compressed; dorsum between the shoulders bearing two abbreviated carinulæ; median carina strongly sinuate compressed forward on the gibbosity and backward interrupted sinuate; posterior process cuneate, the apex acute and little turned upward passing little beyond the hind femoral knees; posterior angles of lateral lobes dilated but constricted and formed in a produced sharp transverse spine; elytra subovate; wings developed reaching nearly to the pronotal apex and beyond the hind femoral knees. Anterior femoral carinæ sinuate; middle femora below subtrilobate; posterior femora stout, rugose, outer face above bearing a series of nodes; first articles of posterior tarsi little longer than the third, the three pulvilli acute subspinose, nearly equal in length, but the third more flat below.

Male and female, entire length of body 8·7—9·5mm.; pronotum 8—9·5mm.; post. femora 3·7—4mm.

Habitat: BIHAR, Pupri, Muzaffarpur (*P. U. N.*); Pusa (*H. M. Lefroy*), Mar. 5, 1904; Durbhanga (*P. U. N.*), Jan. 5, 1905. Pusa coll.

Genus MAZARREDIA.

Bolivar, Ann. Soc. Ent. Belg. XXXI, p. 236, 1887; Hancock, Gen. Ins. Orthopt. Fasc. 48, p. 42, 1906.

M. latifrons sp. nov.

Dark rufescent. Vertex horizontal, very wide, equal to twice the breadth of one of the eyes, slightly widened backward, frontal carinulæ roundly reflexed laterally, median carina somewhat distinct and roundly protruding at the front border, on each side fossulate; frontal costa produced subsinuate between the eyes and arcuate protuberant between the antennæ, viewed in front moderately sulcate between the paired ocelli and very little widened forward subparallel; paired ocelli placed barely below the middle of the eyes; antennæ placed between the lower angles of the eyes. Pronotum deplanate, rugose, marked with cicatrices backward on the process, forward compressed gibbose between the thoracic sulci, elevated higher than the dorsum, summit little crenulate; prozonal carinæ forward distinct and convergent backward; lateral carinæ extended forward on the shoulders as granulate lines, making them bicarinate; dorsum between the shoulders rather narrow, bearing abbreviated carinulæ on each side, and depressed backward behind the anterior gibbosity; posterior process acuminate produced beyond the hind femoral knees, the lateral carinæ little compressed; posterior angles of the lateral lobes reflexed, angulate, obliquely truncate behind; elytra strongly punctate, rather small, oblong and subobliquely truncate behind; wings explicate reaching to the pronotal apex. Anterior and middle femora little compressed, margins granulate; hind femora elongate, with distinct antegenicular spine, outer face bearing oblique ridges and above provided with a series of large tubercles, the carinæ minutely serrulate-granose, hind tibiæ subsinuous, strongly armed with spines, all the pulvilli of the posterior tarsi equal in length.

Female, entire length of body 14mm.; pronotum 13mm.; post. femora 7·5mm.

Habitat: BENGAL, Phoobsering, Lebong, Darjiling, 5,000 ft. (*Partridge*). Pusa coll.

This species nearest resembles *M. lativertex* Brunn., but the pronotum is more gibbose, and differs in the shape of the lateral lobes.

M. chinensis sp. nov.

Similar to the preceding; body moderately crassate; dorsum gibbose forward and strongly rugose-cicatrose; colour dark brownish rufescent. Vertex very wide, fully twice the breadth of one of the eyes, fossulate on each side forward, median carina little roundly produced beyond the eyes; frontal costa sinuate between the eyes and protuberant between the antennæ. Pronotum gibbose forward between the thoracic sulci, the summit crenulate and elevated distinctly higher than the dorsum; median carina distinctly excavate between the humeral angles, backwards irregularly tuberculate or crenulate; dorsum strongly bifossulate longitudinally on the disc and base of process and strongly rugose cicatrose, posteriorly lengthily acuminate produced beyond the hind femoral knees, about four millimetres; elytra of moderate size, the apices obliquely rounded-truncate; wings reaching to the pronotal apex; posterior angles of the lateral lobes of pronotum distinctly angulate deflexed, obliquely truncate subsinuate behind. Anterior femora little compressed; middle femora slender, the carinæ sinuous; posterior femoral carinæ above entire, minutely serrulate, triangularly acute dentate before the knee, inferior carina provided with a series of small light tubercles, the external pagina above bearing a series of large rugose tubercles, the middle portion having oblique rugulæ.

Male and female, entire length of body 17—18mm.; pronotum 16—17mm.; posterior femora 7—8mm.

Habitat: Tonkin, Than Moi, 2—3,000 ft. April—May. (*H. Rolle*). In my collection.

The vertex in this species resembles *latifrons* nov. sp., and *lativertex* Brunn., but it differs in being a larger species, the pronotum above more uneven, rugose; the forward gibbosity more pronounced, and the lateral lobes more strongly deflexed, while the pronotal process is longer, and a series of very small tubercles marks the course of the lower hind femoral carinæ. It differs from *sculpta* Bol. in the more strongly deflexed lateral lobes, and distinctly rugose pronotum, as well as the wider vertex.

M. dubia sp. nov.

Body less crassate, dorsum smoother, though somewhat rugose and not at all gibbose ; colour gray, pale variegated or brownish rufescent. Vertex little wider than one of the eyes, deplanate and ampliate backward, front border advanced nearly as far as the eyes, the small frontal carinulæ obliquely curvate laterally, median carina little roundly produced ; frontal costa distinctly arcuate protuberant between the antennæ and between the eyes slightly sinuate, moderately sulcate ; paired ocelli placed between the middle of the eyes ; antennæ inserted in advance of the eyes but scarcely below their lower angles. Pronotum above deplanate, dorsum granulose-tuberculose, between the shoulders transversely convex, bearing two abbreviated carinæ ; humeral angles bicarinate ; median carina slightly sinuate forward, barely elevated between the thoracic sulci, then straight backward ; prozonal carinæ forward distinct and decidedly convergent backward ; posterior process lengthily subulate produced, over four millimetres beyond the hind femoral knees ; posterior angles of the lateral lobes little deflexed, angle obtuse, obliquely truncate behind ; elytra rather large, elongate, apex subrounded truncate ; wings extended as far as the pronotal apex. Femora slender, anterior femoral carinæ substraight ; middle femoral carinæ subundulate ; posterior femora externally rugose, bearing a series of large tubercles above, and oblique rugæ at the middle portion, carinæ above and below entire ; the three pulvilli of the posterior tarsi equal in length.

Male and female, entire length of body 15·5—16·5mm. ; pronotum 14·5—16mm. ; post. femora 6·5—7mm.

Habitat : BENGAL, Phoobsering, Lebong, Darjiling, 5,000 ft. (*H. M. Lefroy*). Pusa coll.

This species has the dorsum more equal than *sculpta* Bol., and lacks the forward gibbosity on the pronotum.

Genus SPADOTETTIX.

Hancock, Spolia Zeylanica, VI, p. 146, 1910.

Body rugose or granose, apterous or winged. Vertex subhorizontal, wider than one of the eyes and strongly produced, middle carinate, very prominently projecting from the front border; viewed in profile acute angulate produced; face strongly oblique; frontal costa sinuate between the eyes; antennæ short, articles elongate, composed of fourteen articles, inserted between the lower angles of the eyes; superior paired ocelli placed between the middle of the eyes and conspicuous in profile view; eyes moderately small, conoidal in profile. Pronotum rugose, or granose, truncate anteriorly; dorsum deplanate, posterior process acute produced; posterior angles of the lateral lobes deflexed truncate or acute produced; anterior and middle femora elongate, slightly compressed, carinæ subundulate or below sublobate; posterior tibiæ scarcely ampliate towards the apices, more or less sinuate-curvate, carinæ armed with spines; first article of the posterior tarsi equal to the third or scarcely longer.

The above generic description is somewhat modified in order to admit the new species from India herewith described. The species *fletcheri* Hanc. from Ceylon is apterous, the new species being winged. This genus belongs in the section *Metrodoræ* near *Mitritettix* Hanc. (*Mitraria* Bol. preoccupied. *)

S. provertex sp. nov.

Body rugose, colour brownish rufescent; eyes small, conoidal in profile; face strongly oblique. Vertex strongly produced, about twice the breadth of one of the eyes, front border carinate, subrounded, the median carina distinctly produced as a projecting tooth and crassate at the apex; in profile acute angulate produced about three-fourths the length of one of the eyes; frontal costa sinuate between the eyes, little compressed between the antennæ; paired ocelli conspicuous; antennæ inserted between the lower part of the eyes; apical articles of palpi widely dilate. Pronotum above deplanate, convex between the shoulders, dorsum rugose bearing distinct elevated lines, tubercles and granules; shoulders

* See Gen. Insect. Fasc. 48, p. 51, 1906; Trans. Ent. Soc., Lond., p. 229, 1907.

bicarinate, humeral angles inconspicuous and carinæ indistinct; prozonal carinæ rather long, parallel but interrupted backward; lateral carinæ on the process distinct, little compressed, and percurrent forward on the shoulders; median carina interrupted tuberculate; posterior process acuminate produced much beyond the hind femoral knees, toward the apex rather stout; posterior angles of the lateral lobes deflexed laminate, constricted subspinate produced and above subcarinate; elytra elongate, apices rounded; wings extended nearly to the pronotal apex. Anterior and middle femoral carinæ below indistinctly bilobate; posterior femur elongate, margins minutely serrulate; posterior tibiæ sinuate-curvate, carinæ armed with spines; the first article of the posterior tarsi having the first two pulvilli equal in length, the third little longer and flattened below.

Female, entire length of body 14·8mm.; pronotum 13·4mm.; post. femora 6mm.

Habitat: MADRAS, Shevaroys, 4,000 ft., Aug. 1907, (*C. W. Mason*). Pusa coll.

This interesting species is much more rugose and larger than *fletcheri* Hanc., and very distinct, though similar in the head characters.

Genus SYSTOLEDERUS.

Bolivar, Ann. Soc. Ent. Belg. XXXI, p. 234, 1887; Hancock, Spol. Zeyl. II, pp. 136, 137, 1904; Gen. Ins. Orth., Fasc. 48, 33, 1906.

S. lobatus sp. nov.

Body little rugose, granulose, eyes strongly exserted, colour grayish fuscous. Vertex narrowed forward, about half the breadth of one of the eyes, frontal carinulæ very small, obliquely curvate laterally, median carina little prominently advanced, about as far as the eyes; frontal costa compressed carinate between the eyes, indistinctly sulcate between the paired ocelli and widely sulcate forward, marked with minute pale spots, in profile arcuate pro-

tuberant between the antennæ and sinuate at the base; antennæ inserted much below the eyes; ocelli placed between the lower fourth of the eyes. Pronotum deplanate, granulose, little rugose in front of the shoulders, lightly constricted; anterior margin not reflexed, sulci strongly impressed; dorsum between the shoulders depressed and behind the shoulders bifossulate; lateral carinæ at base of process distinctly extended forward between the shoulders, making the humeral angles bicarinate; prozonal carinæ forward distinct and subdivergent backward; median carina irregularly undulate; process long acute produced, the apex not at all bispinose; posterior angles of the lateral lobes decidedly deflexed, scarcely sinuate-truncate obliquely behind; elytra small, acuminate toward the apices; wings extended to the pronotal apex. Anterior and middle femora elongate, margins entire; subgenital plate below the female ovipositor dentate produced at the middle.

Female, entire length of body 13·5mm.; pronotum 12·5mm.

Habitat: Bengal, Phoobsering, Lebong, Darjiling, 5,000 ft. (*Partridge*) October. Pusa collection.

This species has the vertex wider than usual, and it resembles *anomalus* Hanc. These two species recall *Bolotettix*, and seem to merge into that genus.

Genus Coptotettix.

Bolivar, Ann. Soc. Ent. Belg. XXXI, p. 287, 1887; Hancock, Spol. Zeyl. II, p. 152, 1904; Gen. Ins. Fasc. 48, Orthopt., p. 65, 1906.

C. indicus sp. nov.

Obscure grayish brown, process lighter; body minutely rugose-granulate. Head not at all exserted; vertex equal in width to one of the eyes, narrowed forward and fossulate on each side, the supraocular lobes distinct, median carina joined with the frontal costa roundly produced in profile, base entire, the carinæ of frontal costa viewed in front narrowly sulcate behind the paired ocelli and extended subparallel forward; antennæ inserted distinctly between the eyes. Pronotum above minutely rugulose, granose,

and subtuberculose on the process ; dorsum between the shoulders convex, and bearing two abbreviated carinulæ ; humeral angles widely obtuse carinate ; lateral carinæ indistinctly percurrent on the shoulders, base of process slightly depressed ; median carina scarcely elevated between the sulcus forward, then sinuous backward ; process lengthily acuminate produced beyond the hind femoral knees (two and one half millimetres) ; posterior angles of the lateral lobes slightly reflexed, the apex narrowly angulate truncate ; elytra moderately large, elongate, apices obliquely rounded : wings extended beyond the pronotal apex ; anterior femora filiform ; middle femora in the male ampliate-compressed ; posterior femora distinctly widened toward the base, stout ; the third pulvillus of the posterior tarsus distinctly longer than the second ; posterior tibial carinæ minutely serrulate and armed with spines.

Male, entire length of body 12mm. ; pronotum 11·5mm. ; post. femora 5·3mm.

Habitat : Bombay, Kalyan, 14 Aug. 1910 (*T. Bainbrigge Fletcher*). Pusa coll. "At light."

This species is smoother than *fossulatus* Bol. from Ceylon, the pronotum less tectiform, has longer wings and larger elytra.

C. parvulus sp. nov.

Body very small, coloured brownish, lighter and variegated with fuscous on the pronotum. Head not at all exserted ; vertex narrowed forward, little narrower than one of the eyes, and fossulate on each side, frontal carinulæ subtransverse but angularly reflexed laterally, middle carinate ; frontal costa arcuate produced between the antennæ, barely subsinuate between the eyes, and little sinuate at the base, viewed in front widely and evenly divergent forward ; antennæ inserted between the lower part of the eyes, articles strongly elongate. Pronotum anteriorly scarcely obtuse angulate, posteriorly abbreviated, the apex widely rounded, and reaching to about the middle of the hind femora ; dorsum granulate, transversely tectiform between the shoulders and subbifossulate behind the disc ; median carina compressed, little arcuate

forward, straight on the disc, sloping toward the apex; humeral angles obtuse carinate; posterior angles of the lateral lobes obtuse, little reflexed, the superior sinus very shallow; elytra very minute, elongate; wings not visible. Anterior femoral margins below little compressed entire; middle femora in male wider compressed, the width about one half that of the length, bicarinate above, margins entire; posterior femora strongly crassate, the superior carinæ minutely serrulate and bearing an angulate lobe before the knees, carina below marked with black spots; the first and second pulvilli of the posterior tarsi acute spinose, the third longer.

Male, entire length of body to apices of hind femora 7mm.; pronotum 4mm.; hind femora 3·5mm.

Habitat: Bihar, Chapra, (*Mackenzie*). Pusa collection.

C. curtipennis sp. nov.

Body robust, short-winged, above minutely rugose-granose, colour entirely ochre-brown except two dark spots behind the disc. Vertex narrowed forward, subequal in width to one of the eyes, transversely carinate, angularly reflexed at the sides, little arcuately elevated, fossulate on each side between the forward half of the eyes, the front advanced as far as the eyes; frontal costa widely sulcate, in profile convex between the antennæ, not at all sinuate between the eyes; paired ocelli placed between the lower third of the eyes; antennæ inserted considerably below the eyes. Pronotum deplanate above, gibbulose forward between the sulci; the median carina arcuate forward, depressed between the shoulders and then undulate interrupted backward; dorsum rather wide between the shoulders, rugose granulose, and somewhat tuberculose, prozonal carinæ forward distinct, very short, and convergent backward; pronotal process produced cuneate, reaching to the apices of the hind femora; posterior angles widely rounded, little reflexed; elytra of moderate size, acuminate towards the apices; wings extended little beyond the pronotal apex. Anterior and middle femoral margins subentire, below setose or hirsute; posterior femora crassate, the superior carina at the distal half

serrulate and tridentate including the apical spine, external lateral carina subtuberculose, inferior carina sparingly setose; hind tibiæ crassate and armed with strong spines; first article of the posterior tarsi longer than the third, the first and second pulvilli small, the third as long as the first and second combined.

Female, entire length of body 9·7mm.; pronotum 9mm.; post. femora 6mm.

Habitat: Bengal, Lebong, Darjiling, 5,000 ft. June 1909, (*H. M. Lefroy*). Pusa coll.

The position of the paired ocelli and the insertion of the antennæ in this species is like the structure found in *Mazarredia* Bol., and the present species occupies a place on the border line between the two genera.

Genus Hedotettix.

Bolivar, Ann. Soc. Ent. Belg. XXXI, p. 283, 1887; Hancock, Spol. Zeyl. II, p. 148, 1904; Gen. Ins. Fasc. 48, Orthopt., p. 60, 1906.

H. gracilis de Haan.

Acridium (*Tetrix*) *gracile* de Haan, Bijdrag. Orthopt., p. 169, 1843; Bolivar, l. c. p. 286; Hancock, Spol. Zeyl. II, pp. 149, 150, figs. 19-19*b*, 1904.

Habitat, Bihar, Pusa, Chapra. Pusa collection.

Some of these specimens resemble representatives in my collection from Java and Ceylon, but there is also a variety that is more slender between the shoulders.

H. costatus sp. nov.

Body granulose, colour variable, often pale ferruginous or fuscous, or pale testaceous on the dorsum. Vertex narrowed forward, equal in width to one of the eyes, angulate produced, middle carinate; frontal costa narrowly sulcate, viewed in profile strongly arcuate produced beyond the eyes; the vertex joined with the frontal costa obtuse angulate, face oblique; paired ocelli placed between the upper fourth of the eyes; antennæ inserted between

the lower fourth of the eyes. Pronotum above granulose, front obtuse angulate, posterior process lengthily subulate extended beyond the hind femoral knees; median carina compressed forming a low graceful arc, highest on the disc and sloping backward; dorsum between the shoulders tectiform, bearing two obscure abbreviated lines on the disc, and just behind the humeral angles bicarinate; prozonal carinæ subdivergent backward; posterior angles of the lateral lobes narrowed subacute; elytra rather large subacuminate and narrowly rounded toward the apices; wings extended much beyond the pronotal apex. Anterior femora smooth, elongate, entire; middle femora little compressed in female, in the male strongly incrassate, the upper margin arcuate; the first and second pulvilli of the posterior tarsi acute spinose, the third hardly longer or subequal with the second and little flattened below.

Male and female, entire length of body 12·5—14·5mm.; pronotum 10—11·5mm.; posterior femora 5mm.

Habitat: Bihar, Chapra; Pusa: Bengal, Naraingunj; Dacca. Pusa coll.

Taken "On grass," "At light" and on "River bank."

A number of examples in the Pusa collection taken by Mr. Fletcher and others.

This species is at once distinguished from *gracilis* de Haan by the obtuse angulate profile of the head, the low arcuate median carina of the pronotum, and the narrowly sulcate frontal costa.

There is a variety from Durbhanga that has a slightly smaller stature, but not ranking as a distinct species.

H. diminutus sp. nov.

Resembling *gracilis* Haan, especially in the arcuate median carina of the pronotum and vertex, but differs in the smaller stature, scarcely angulate anterior border of pronotum and minutely rugose granulate dorsum. Vertex subequal in width to one of the eyes; frontal costa roundly produced, viewed in front rather widely sulcate. Pronotum anteriorly scarcely obtuse angulate, backward

acuminately produced beyond the hind femoral knees ; elytra moderately large, apices little narrowed rounded ; wings fully explicate, extended much beyond the pronotal apex. Middle femora of male little compressed but not inflated, margins above and below substraight, and minutely granose ; posterior femora externally scabrous-granose ; the first pulvilli of the posterior tarsi small acute, the second little longer and acute, the third as long as the first and second united and flat below.

Male and female, entire length of body 10—12mm. ; pronotum 8—9mm. ; posterior femora 4·8—5mm.

Habitat : Bombay, Surat. Pusa collection.

Genus Tetrix.

Latr., Hist. Nat. Crust. Ins. III, p. 284, 1802 ; Hancock, Gen. Ins. Fasc. 48, Orthopt., p. 57, 1906, etc. ; *Acrydium* Geoffr., Hist. Ins. I, p. 390, 1762, etc. ; *Tettix* of authors.

T. variegatus Bol.

Paratettix variegatus Bol., Ann. Soc. Ent. Belg. XXXI, p. 280, 1887 ; *Tettix atypicalis* Hanc., Spol. Zeyl. II, p. 142, 1904.

Habitat : S. India, Pondichery : Ceylon.

This species has the pronotum tectiform, and the median carina arcuate forward. In my former article on the " Tettigidæ of Ceylon " (Spolia Zeylonica II, p. 142, 1904) under the genus *Tettix* I described this species under the name *atypicalis* Hanc., and the short-winged form as *ceylonicus* Hanc., the former being figured. My name *ceylonicus* Hanc., can be retained for the short-winged form of Ceylon, the name *atypicalis* falling as a synonym. Whether this is one of the species described earlier by Walker is impossible to determine from his descriptions.

Genus Paratettix.

Bolivar, Ann. Soc. Ent. Belg. XXXI, p. 270, 1887 ; Hancock, Spol. Zeyl. II, p. 144, 1904 ; Gen. Insect. Fasc. 48, Orthopt., p. 55, 1906.

P. indicus Bol.

Ann. Soc. Ent. Belg., p. 281, 1887.

Habitat: BIHAR, Chapra; Gorakhpur, June 20, 1910; Pupri, Muzaffarpur (*T. V. R. Aiyer*). Pusa collection. Oriental India (Bolivar).

This long-winged species somewhat resembles *Tetrix subulatus* L., and it presents a variety of coloration similar to that species.

Genus EUPARATETTIX.

Hancock, Spol. Zeyl. II, p. 145, 1904; Gen. Ins. Orthopt. Fasc. 48, p. 55, 1906.

Members of this genus are represented by a considerable number of species in India and Ceylon. They differ from typical species of *Paratettix* Bol. in the exserted eyes, the pronotum in front not touching them, and the first and third articles of the posterior tarsi being about equal in length. They are all provided with fully developed wings.

Key to species of India and Ceylon.

1 (2). Pronotal disc bearing abbreviated carinæ on each side, *variabilis* Bol.

2 (1). Pronotal disc not bearing abbreviated carinæ.

3 (10). Frontal costa arcuate produced, in profile showing above the paired ocelli, base entire; paired ocelli placed between the middle of the eyes; rather long species.

4 (9). Head and eyes distinctly exserted, face oblique.

5 (7). Median carina of pronotum low, entire or nearly so.

6 (8). Hind tibiæ brownish or pale dusky not marked with black; pronotum long subulate, narrow between the shoulders; head exserted; middle femora elongate, margins entire, *tenuis* sp. nov.

7 (5). Median carina of pronotum more or less undulate.

8 (6). Hind tibiæ margined with black; head exserted, *personatus* Bol.

9 (4). Head and eyes very little exserted, eyes nearly on level with dorsum ; pronotum moderately crassate, smooth granulate ; median carina scarcely undulate, little elevated substraight over disc ; colour grayish, hind tibiæ pale, *corpulentus* sp. nov.

10 (3). Frontal costa not produced, arcuate protruding between the antennæ but in profile obscured by the eyes, not showing above the paired ocelli ; paired ocelli placed distinctly below the middle of the eyes ; shorter species.

11 (12). Pronotum distinctly rugose tuberculose, bearing small nodules ; median carina strongly sinuate and subnodulose backward behind the disc on hind process, the lateral carinæ of process bearing distinct projecting crenulations ; hind femora distinctly tuberculate on outer face, *nodulosus* sp. nov.

12 (11). Pronotum little rugose tuberculate ; median carina compressed-undulate or sinuate ; hind femora bearing very minute projecting tubercles on external pagina ; hind process with the lateral margins not at all or indistinctly crenulate, *parvus* Hanc.

13 (14). Head and eyes little exserted, face oblique ; median carina of pronotum more or less undulate ; colour of body variable, hind tibiæ pale, or with dusky marking darker toward the apices ; middle femora of male strongly crassate ; body nearly smooth or little rugose, *crassipes* sp. nov.

14 (13). Head not at all or scarcely exserted, face nearly vertical ; pronotum almost touching the eyes ; median carina lightly multisinuate ; body minutely rugose ; colour brownish-rufescent ; hind tibiæ and tarsi rufescent, infuscate toward the apices, *bengalensis* sp. nov.

E. tenuis sp. nov.

Colour variable, often grayish, reddish, or dark fuscous variegated, dorsum plain or rarely with black spots ; wings strongly caudate. Head and eyes exserted, vertex narrower than one of the eyes, front carinate and interrupted at the middle, truncate, little roundly elevated and reflexed at the sides ; frontal costa arcuate produced beyond the eyes, viewed in front moderately

sulcate, extended above the paired ocelli; antennæ very slender, articles elongate, inserted between the lower angles of the eyes; paired ocelli placed between the middle of the eyes. Pronotum slender, anteriorly truncate, subtectiform between the shoulders, lengthily acuminate produced beyond the hind femoral knees, nearly as far as the apices of the hind femora; anterior prozonal carinæ very short and parallel; median carina nearly straight, compressed percurrent, entire, often very slightly arcuate or substraight on the disc, then substraight or concave backward; posterior angles of the lateral lobes turned down, acute angulate and apex obtuse; elytra subovate, apices rounded; wings strongly extended backward, reaching beyond the apices of the hind tibiæ; first and second femora slender, in the male little wider and compressed, but distinctly elongate, carinæ entire; posterior femora slender; first and second pulvilli of hind tarsi minute, acute dentate, the third longer than the second, the first and third articles of posterior tarsi equal in length.

Male and female, entire length of body 15—17mm.; pronotum 11·5-13·5mm.; posterior femora 5mm.; wings passing pronotum 3—3·6mm.

Habitat: Bihar, Pusa; Chapra: Bengal, Lebong; Dacca: United Provinces, Partabgarh.

Numerous examples of this very long-winged species in the Pusa collection.

This species belongs near *personatus* Bol.

E. personatus Bol.

Bolivar, Ann. Soc. Ent. Belg. XXXI, p. 278, 1887; Hancock, Spol. Zeyl. II, p. 146, 1904, fig. 10-10*b*.

Habitat: Bihar, Pusa: Bengal, Dacca. Four examples in the Pusa coll.

These specimens from India differ slightly from specimens in my collection from Ceylon, the median carina of the pronotum being more sinuate on the disc; the wings fuscous or pale spotted.

E. corpulentus sp. nov.

Body smooth, granulate, colour grayish or reddish, variable, tibiæ pale often cinereous, rarely obscure infuscate. Head very slightly or not at all exserted. Vertex narrower than one of the eyes, front carinate, reflexed at the sides, middle carinate ; frontal costa arcuate produced, barely sinuate at the base. Pronotum somewhat crassate, posteriorly subulate, lengthily passing the hind femoral knees ; dorsum smooth or very slightly rugose, lightly constricted forward ; median carina percurrent, entire or very little crassate or elevated between the thoracic sulci forward, obliterated near the front border, and elevated substraight on the disc ; posterior angles of the lateral lobes turned down, acute angulate, the apex narrowly rounded ; wings lengthily extended beyond the pronotal apex. Anterior and middle femora elongate, carinæ entire ; first and second pulvilli of posterior tarsi acute spinose, the third longer than the second and substraight below.

Male and female, entire length of body 13—17·5mm. ; pronotum 10—13mm. ; post. femora 5—6mm.

Habitat : Bihar, Chapra ; Pusa ; Bengal, Dacca : Assam. Pusa collection. This species also occurs in Ceylon.

E. crassipes sp. nov.

Colour ferruginous, or dark, rarely with light longitudinal fascia above, and black spots behind the disc. Body pilose below. Head exserted, moderately obliquely placed. Vertex narrower than one of the eyes, little narrowed forward ; frontal costa lightly arcuate produced between the antennæ, but not at all produced above the paired ocelli when viewed in profile, lightly sinuate at the base ; paired ocelli placed between the lower third of the eyes. Pronotum posteriorly subulate, extended much beyond the hind femoral knees ; dorsum plain or little rugose, convex between the shoulders ; median carina little compressed, lightly undulate, little elevated crassate forward between the thoracic sulci ; posterior angles of lateral lobes acute angulate, apex rounded or narrowly obtuse ; elytra oblong, apices rounded ; wings extended beyond

the pronotal apex. Anterior femora narrow, margins entire; middle femora in female little wider and compressed, in the male strongly crassate; posterior femora little rugose on the outer pagina, with a series of crassate tubercles above, and bearing oblique tubercles but not distinctly projecting; all three pulvilli of the posterior tarsi acute spinose, the third little longer than the second; posterior tibiæ pale, often indistinctly clouded and darker toward the apices.

Male and female, entire length of body 11—12·5mm.; pronotum 8·5—9·5mm.; posterior femora 4—4·5mm.

Habitat: BIHAR, Pusa; Chapra; Pupri, Muzaffarpur: BENGAL, Dacca. Pusa collection.

This species is subject to great variation, some specimens being more brownish on the pronotum and with the hind tibiæ suffused with brown. One specimen even being black excepting the hind tibiæ. This variation applies also to the median carina of the pronotum which often presents undulations, and indistinct abbreviated lines between the shoulders, which are more often absent.

E. bengalensis sp. nov.

Brownish ferruginous, hind tibiæ brownish or suffused with fuscous darker toward the apices; body hirsute below. Head not at all exserted, placed slightly oblique, pronotum nearly touching the eyes. Vertex little narrower than one of the eyes, narrowed forward; frontal costa arcuate between the antennæ but not at all produced above the paired ocelli, base very slightly sinuate. Pronotum subulate; little crassate and convex between the shoulders; dorsum minutely rugose, rarely with indistinct lines between the shoulders, median carina thin, percurrent, but multiundulate; hind process extended beyond the hind femoral knees; posterior angles of the lateral lobes acute angulate, with the inferior margins oblique, toward the apex narrowly curved and truncate, barely reflexed; elytra elongate, rather narrowly rounded at the apices; wings extended beyond the pronotal apex. Anterior femora elongate, margins entire, middle femora in the females elongate, margins

subundulate, but in the male strongly crassate, larger toward the basal half; hind femora moderately crassate, with projecting tubercles on the outer face, and a series of large tubercles above; all three pulvilli of posterior tarsi acute spinose, the third nearly the same size as the second.

Male and female, entire length of body 9·5—10·5mm.; pronotum 8—8·5mm.; hind femora 3mm.

Habitat: BIHAR, Pusa; Pupri, Muzaffarpur: BENGAL, Dacca. Pusa collection.

E. nodulosus sp. nov.

Brownish ferruginous or gray, hind tibiæ brownish darker toward the apices, or in variety with two bands of black. Head little exserted, summit of eyes nearly on level with median carina of pronotum. Vertex narrower than one of the eyes; frontal costa arcuate between the antennæ but not at all produced above the paired ocelli. Pronotum subulate, extended backward beyond the hind femoral knees; dorsum rugose, minutely nodulose, widened between the shoulders; humeral angles carinate; prozonal carinæ forward small and indistinct; pronotum decidedly constricted between the sulci; median carina strongly sinuate, little compressed elevated, and subundulate on the disc, but backward strongly sinuate-nodulose; dorsum nodulose laterally above the base of the hind femora; lateral margins towards the apex of process provided with several pairs of projecting tubercles or crenulations, the apex barely crassate-truncate; posterior angles of the lateral lobes having the apices rather narrowly rounded; elytra elongate, apices rounded; wings extended beyond the pronotal apex. Anterior femora narrow, rugose-pilose; middle femora in the female little compressed, margins distinctly undulate-lobate and pilose, in the male distinctly crassate, sublobate at the middle; posterior femora externally strongly tuberculate, bearing distinct projecting tubercles, superior carinæ minutely serrulate before the knees; all three pulvilli of the posterior tarsi acute spinose, the third nearly equal to the second.

Male and female, entire length of body 8·5—10·5mm.; pronotum 7·5—8mm.; posterior femora 3·5—4mm.

Habitat: BIHAR, Pupri, Muzaffarpur; Pusa: BENGAL, Dacca. Pusa collection.

This species resembles *parvus* Hanc., but differs in the strongly sinuate-nodulose median carina of the pronotum, and the brownish hind tarsi. In *parvus* Hanc. the tarsi are marked with white and black bands, and the pronotum is less rugose.

E. parvus Hanc.

Hancock, Spol. Zeyl. II, 145, 1904, *Euparatettix pilosus* Hanc., Trans. Ent. Soc., London, p. 410, 1909.

Habitat: BIHAR, Chapra; Pusa: ASSAM.

A study of the series of specimens in the Pusa collection convinces me that this species is synonymous with *E. pilosus* Han.

Genus SAUSSURELLA.

Bolivar, Ann. Soc. Ent. Belg. XXXI, p. 303, 1887; Hancock, Gen. Ins. Orthopt. Fasc. 48, p. 72, 1906.

Key to species including those from India.

1 (4). Wings not passing the pronotal apex.

2 (3). Inferior margin of pronotal cornu concave; length of pronotum 14mm. (Java) *cornuta*, Haan.

3 (2). Inferior margin of pronotal cornu straight, and shortly produced, median carina of pronotum nearly horizontal throughout; length of pronotum of male 11mm. (Burma), *brunneri* Hanc.*

4 (1). Wings passing the pronotal apex.

5 (10). Pronotal cornu straight.

6 (9). Direction of cornu strongly ascendant, oblique.

7 (8). Cornu lengthily produced, in female 4mm., margin below straight; pronotum of female 21mm., *sumatrensis* Bol.

* The species called *Saussurella cornuta* de Haan, described and figured by Brunner as occurring in Burma, is evidently a distinct species. I have applied the name *Saussurella brunneri* to this new species, and thus characterize it in the key.

8 (7). Cornu moderately produced, in female 2·5-3mm., margin below barely convex; pronotum of female 19mm.; middle lobe of subgenital plate subangulate ; in male transversely truncate not widened apically. (Sumatra), *cornifrons* Hanc.

9 (6). Direction of cornu very slightly oblique ; pronotum of female 20mm.; middle lobe of subgenital plate convex. (Borneo), *borneensis* Hanc.

10 (5). Pronotal cornu more or less decurved toward the apex.

11 (16). Apex of cornu very slightly decurved.

12 (13). Body moderately large; pronotum of male 16·5mm.; sides of pronotum distinctly compressed behind the disc ; subgenital plate of male widely transversely excised, widened apically (India), *curticornu* Hanc.

1 (12). Body smaller, less than 16mm.

14 (15). Colour above fuscous-virescent ; pronotum of female 14·5mm. (Java), *javanica* Bol.

* Body fawn coloured ; length 14·5mm. (China), *cucullifera* Walk.

15 (14). Colour above yellowish brown, cornu strongly ascendant ; female pronotum 15·5mm.; middle lobe of subgenital plate acute produced ; subgenital plate of male emarginate. (India), *indica* Hanc.

16 (11). Apex of cornu distinctly decurved ; pronotum of male 12·5mm. (Burma), *decurva* Brunn.

S. indica sp. nov.

Body conspersed with coarse rounded granulations ; colour yellowish brown, legs somewhat infuscate. Vertex very wide ; frontal costa viewed in front more widely sulcate just above the insertion of the antennæ, the rami slightly convergent forward, median facial carina at the vertex rather distinct ; antennæ brownish, slender, and inserted between the lower part of the eyes, the four or five apical segments black ; palpi pale. Pronotum anteriorly

* *Tettix cucullifera* Walk.

produced in a stout, compressed, ascendant process slightly decurved which in profile forms nearly an acute angle with a line drawn forward from the dorsum, the process near the base little wider in diameter than one of the eyes, the superior margin between the eyes and the apex strongly arcuate, below oblique but towards the apical half slightly concave ; at the basal sides arcuately excavate for the reception of the eyes ; viewed from above the process cuneate, the median carina acute compressed towards the apex, lateral margins barely concave or substraight, and apex rounded; dorsum triangularly depressed-fossulate on each side behind the shoulders ; median carina between the shoulders concavely depressed and backward convex on base of process and barely concave towards the apex, the median and lateral carinæ obsolete towards the pronotal apex ; posterior process extended beyond the hind femoral knees and slightly turned up at the apex ; lateral lobes deflexed obliquely nearly rectangulate, posterior inferior sinus very widely obtuse ; elytra small, elongate, apex rounded, outer face black, distinctly circumbordered with pale brownish-ochre ; wings extended beyond the pronotal apex from ·5mm.—1mm. Middle femora armed with apical spine ; posterior tibiæ sinuate-curvate, carinæ bearing moderately distinct spines, particularly on the outer border ; the three pulvilli of the posterior tarsi equal in length and obtuse. Subgenital plate of male emarginate, in the female trilobate, the middle lobe below the ovipositor acute produced.

Male and female pronotum including cornu 13—15·5mm. ; hind femora 6—7mm. ; frontal cornu 2·6—3mm.

Habitat : Bengal, Lebong, Darjiling, 5,000ft. June 1909 (*H. M. Lefroy*). Pusa collection.

S. curticornu sp. nov.

Colour dark brown, infuscate forward on the pronotum, sides and legs, dark brown below. Furcation of frontal costa widened above the antennæ, median facial carina at the vertex obsolete ; antennæ pale, the six apical articles black. Pronotum anteriorly produced in a stout compressed cornu, obliquely ascendant, very

lightly decurved, and not quite so elevated or so long produced as in *indica*, viewed in profile the superior margin rounded just behind the apex, below straight, but the extreme apex very indistinctly decurved, viewed from above acuminate, sides straight, the apex rounded ; dorsum longitudinally canaliculate on each side of the median carina, median carina backward compressed at the base of process and becoming thinner toward the apex ; lateral carinæ percurrent on the shoulders and incrassate ; lateral lobes deflexed obliquely, strongly produced, acute, the apex hebetate ; inferior sinus very wide obtuse angulate ; pronotal process backward lengthily produced, horizontal, extended beyond the hind femoral knees ; elytra elongate, apex rounded, externally black and circumbordered with dark brown ; wings extended beyond the pronotal apex 7mm. subgenital plate of male widely transversely excised, widened apically.

Male, length of pronotum 16·5mm. ; frontal cornu 2·3mm.

Habitat : Bihar, Pusa, Oct. 1906 (*C. S. Misra*). Pusa coll.

S. cornifrons sp. nov.

Colour fuscous, face and lateral lobes behind, pale ochreous, legs marked with ochreous or in the male often entirely that colour excepting the wings and elytra, or infuscate on the dorsum. Rami of facial costa subparallel, median carina above near the vertex barely evident. Antennæ pale ochreous, the apical five articles black ; palpi nearly white. Pronotum anteriorly produced in a straight oblique process, viewed in profile the superior margin straight but at the apex rounded, the margin below barely convex, the apex not at all decurved or sinuate, apical half narrowed toward the apex ; in cross section at the middle triangular ; viewed from above acuminate, the apex narrowly rounded, sides straight, distinctly carinate basally over the eyes ; dorsum subtriangularly fossulate behind the shoulders, median carina compressed, nearly horizontal backward from the frontal cornu, or indistinctly sinuous ; posterior process lengthily extended beyond the hind femoral knees ; lateral lobes obliquely deflexed, acute angulate produced ;

inferior sinus barely indicated and very widely obtuse ; elytra subovate, or elongate, the outer face black circumbordered with fuscous, the apices often marked with white, distinct in females ; wings extended beyond the pronotal apex from 1—1·5mm. Subgenital plate of male transversely truncate, but not widened apically ; subgenital plate in the female trilobate, the middle lobe below the ovipositor subangulate. Male and female pronotum including cornu 17·5—19mm. ; posterior femora 7—8·3mm. ; pronotal cornu 2·5—3mm.

Habitat : Sumatra, Soekaranda (*Dohrn*). My collection.

S. borneensis sp. nov.

Rather large, colour fuscous, face, and pronotal lobes behind pale, hind femora mottled with light ochreous, palpi pale tinged with fuscous. Carinæ of frontal costa parallel, rather pronounced, median facial carina above distinct, as well as the frontal carina of vertex next to the eyes. Pronotal cornu straight in profile, its direction only slightly oblique, strongly produced beyond the head, margin above straight but rounded at the apex, below substraight, viewed from above strongly narrowed forward, acute compressed, apex rounded, sides indistinctly concave ; prozonal carinæ forward on the dorsum indistinctly indicated ; median carina of pronotum compressed, nearly horizontal from the thoracic sulci forward to the hind apex ; dorsum longitudinally fossulate behind the disc on each side ; posterior process lengthily produced beyond the hind femoral knees ; lateral lobes acute angulate, distinctly produced ; inferior sinus very widely obtuse angulate ; elytra subovate, apices rounded, impressed with black, surrounded with pale elevated line below becoming crassate apically and lighter ; wings extended beyond the pronotal apex nearly one millimetre. Subgenital plate below the female ovipositor trilobate, the middle lobe convex.

Female, length of pronotum 20mm. ; posterior femora 7·5mm. ; cornu 3mm.

Habitat : Borneo, Lawas, Sept. 1909. Sarawak Museum.